



## Materials Science and Engineering

### Evaluation Test

#### TOPIC 6. CERAMIC MATERIALS

**Important:** Mark the right answer with a X. The correct answers will mark + 1 points while the incorrect answers will mark as -0.33 points. Non answered questions will not mark nor positively nor negatively. The resulting mark will not be smaller than 0 in any case. There is only one correct answer per question. Good luck!

Silicates with the unit chemical formula of $(\text{SiO}_3)_n^{2n-}$	
<input type="checkbox"/>	form ring or chain structures with two corners of the tetrahedron bonded with corners of other tetrahedral.
<input type="checkbox"/>	form sheet structures such as talc or kaolinite.
<input type="checkbox"/>	form island structures such as fosterite and olivines.
<input type="checkbox"/>	share all the corners of the tetrahedra and form 3D structures.

The perovskite structure can be described in the following way:	
<input type="checkbox"/>	The anions occupying the FCC sites and the cations occupying all octahedral interstitials.
<input type="checkbox"/>	The anions occupying the FCC sites and cations occupying half of the tetrahedral sites.
<input type="checkbox"/>	The A cations and the anions form an FCC unit cell with the A cations occupying the corners and the anion occupying the centre of the face and the B cation is located at the octahedral site at the centre of the unit cell.
<input type="checkbox"/>	The anions occupy the hcp sites and the cations occupy 2/3 of the octahedral interstitials.

Indicate which of the following is <b>true</b> :	
<input type="checkbox"/>	Ceramics exhibit better properties in tension than in compression.
<input type="checkbox"/>	Ceramics exhibit high thermal shock resistance.
<input type="checkbox"/>	$\text{Al}_2\text{O}_3$ is a glass former.
<input type="checkbox"/>	In some ceramic materials such as talc and kaolinite, strong silicate laminas are formed.

Indicate which of the following statements about glasses and ceramics is <b>false</b> :	
<input type="checkbox"/>	Glass modifying oxides break the silicate lattice and decrease the viscosity
<input type="checkbox"/>	Ceramics and glasses have high Weibull modules, indicative of the dispersion in their mechanical properties.
<input type="checkbox"/>	Ceramic materials have low fracture toughness due to the presence of porosity..
<input type="checkbox"/>	Ceramics and glasses exhibit low thermal shock resistance